explained that at that time, heraldry was embodied as a science as nearly as possible to its form at the present day. Tournaments were alluded to as an important means in sustaining the dignified bearing and accurate transmissions of armorial bearings down to the time of Elizabeth, when the establishments of the College of Heraldry, and the visitation made under its direction, created a broad distinctive line between the ancient families and those who have risen to greatness by the increase of civilization and wealth since that period. He next drew attention to those arms and mottoes which, from their relation to names, have been ordinarily considered and termed "punning-arms," but which, he said, had been practised in remote antiquity, when names had a symbolical source and meaning. He mentioned several names derived from important official duties, such as Usher, Butler, Stewart, &c., in which cases the previous family name had been disused, as also that of Godolphin, in accordance with the signification of which a white eagle is adopted as the crest by that family; and this was followed by notices of others of a similar nature. The reader then proceeded to shew, that the great poets of modern Europe have fully appreciated the value of heraldric distinctions, and said, that in the descriptions of their heroes they are usually as heraldically correct as they are poetically beautiful; and referred to, and quoted parts from, Tasso's "Jerusalem," Shakspeare, "Wars of the Roses," &c. Important allusions in many family mottoes, &c., were illustrated, and he then brought the subject to a general summary by maintaining, that the detractors of heraldric science are bound to admit one of these two things, either to prove that all the honours and distinctions which the sovereign of this or any European state can bestow on eminent men are trash, or else to admit that heraldry is one of the most important institutions of civilized Europe, as being the recognised medium by which the sovereign, the fountain of honour, bestows those honours on men who have deserved well of their country.

RAILWAY JOTTINGS.

The *Liverpool Albion*, amongst other suggestions embodied in an article similar to our recent one on railway accidents and their prevention, describes a plan for breaks, originated by Mr. D. Crawford, civil engineer, Birmingham. Mr. Crawford proposes to apply to any number of carriages breaks in connection, and set them altogether in motion by a mechanical force on the last carriage in the train. The engine-driver or the guard may in a moment work the same, as they see occasion. By means of springs, like buffer-springs, the retarding force is distributed equally on every wheel of every carriage. The breaks can also be partly used.——The *Chronicle* describes a somewhat similar invention, by Mr. Davies, coach-builder in Wimpole-street, Cavendish-square, for the prevention of collisions, which has been already tested, it is said with success, on the London and North Western line. On this plan the four wheels of each carriage are firmly grasped by breaks acting at opposite parts of the circumference, so that they are really suspended within them, and the chance of damage to the action is obviated by each break destroying the strong vibration which the adjacent one would otherwise generate. The train, therefore, glides, to all intents and purposes a heavy sledge, the great weight of which occasions such an enormous reduction in the velocity, as to bring the momentum of the train within limits, should the time for preparation become greatly shortened, which might be reduced to the actinn of the buffers.——We have also to record another of the thousand and one suggestions of practical ingenuity for the safety of the public. For the prevention of the tendency of carriages in a train to 'double up' in collision, a correspondent of our own, 'A Young Surveyor,' proposes that a triangular, or dovetailed rod of strong oak, be made to slip in and out of a correspondent orifice in a triangular box, made also strong with iron straps, and even also with double iron dovetails, set into each of its three corners. That the triangular oaken rod or bar be affixed to the front of each carriage, while the correspondent box, into which it is to slip, is affixed to the rear of each other carriage, both being placed in such a way, as our correspondent is willing more particularly to detail, that, while the buffers are being brought into action during collision, or other resistance to the onward impetus of a train, the one will slip into the other, and in the conjunction all tendency of the carriages to jump or double up is thus to be effectually prevented.——So much for safety and facility in stopping trains. We have now to record a new invention or rather discovery for facility and safety in the motion of trains—a sort of grease or rather substitute for grease, invented, as might be anticipated, by one of those go-a-head Americans, who would grease the lightning itself if they could. The material in question consists of water and an anti-attritious composition, which will save nearly 90 per cent. in the cost of oil or grease, besides rendering the heating of axles impossible. The invention is patented, and has been tried, it appears, on an American line, with a train running at the rate of 20 to 30 miles an hour, with axles 'quite cool.'——Meantime, however, the feeling of insecurity which has been generated in the public mind, by the frequency of accidents and the inability of directors—as Mr. Hudson has it—to discover or invent any means for their prevention, has been so unequivocally manifested, that what *Punch* not long since jocularly recommended, has been in earnest set agoing,—namely, a 'Railway Casualty Compensation Company,' who, on pre-payment of certain premiums, are to give so much (200*l.*) for a broken limb, so much (500*l.* to 3,000*l.*) for a broken back or 'fatal injury,' and so on: premiums also to be taken to ensure compensation for life, or till the 'silver cord' *be* broken.——The journey from London to Southampton,—78 miles,—is now performed on the South-Western daily, in 105 minutes, so that the average rate of speed, including stoppages, is a mile in 1·3 minutes.——The public opening of what is held to be the most difficult portion of one of the most difficult railways in the kingdom, viz., the 8¼ miles from Newton to Totnes, on the South Devon line, took place on Tuesday week. There is scarcely a furlong of straight road on the 8¼ miles between Newton and Totness. The section is, in fact, one series of curves.——Two bridges, connected with the Bodmin and Wadebridge line, at the junction with the Cragley, were swept away by a flood during a thunder storm on Friday week. It surely would be well to *calculate* on thunder storms and consequent floods in a climate such as ours; but unfortunately the *strength* of structures is much more frequently calculated according to the resistance of the screw applied by competition, and the directorial desire for cheap and hasty construction, than by any other considerations.——An additional test of 100 tons, says the *Gateshead Observer*, was lately added to the load previously sustained by the river arch now completed at the high level bridge across the Tyne. Not the slightest strain however was perceptible, it is said, at the junctions of the several segments composing the 'bow and string' cast-iron ribs, where any failure would most likely shew itself. Each of the six arches, of 125 feet span, to constitute this bridge, being self-supported, will require to be tested separately. The string which subtends the base of the bow or cast-iron ribs composing the arch, and acts internally, instead of external abutments, consists of a series of wrought-iron plates, linked together in the form of chains. The whole is to stand on stone piers, and provision will have to be made, of course, for any change that may take place in the iron from change of temperature.——On the Stockton and Darliogton line, weekly tickets are granted, for 12s. each, enabling the bolder to travel to and fro, between Darlington and Redcar, as often as required, instead of a payment of 6s. each trip, to and fro. As remarked by the *Gateshead Observer*, the directors deserve great credit and good dividends for their liberality. They also deserve to be imitated as exemplary patterns by other directors.——The foundation-stone of the bridge over the Nith, near Dumfries, on the Carlisle and Glasgow line, was laid on Friday week with Masonic honours and high holiday proceedings.——The permanent way of the Caledonian line is laid in many important parts, and the greatest activity continues to prevail along the whole line, much of which, it is expected, will be opened by the middle of October, and the greater portion in course of the present year.——The London morning papers now travel to Edinburgh on the same day, and the Edinburgh papers, containing their news, return to Newcastle on the following day! The age of miracles has indeed returned. An honest 'philosopher' who would have prognosticated the advent of such a miracle five-and-twenty years ago would have run the risk of being 'precognosced' as a lunatic, if not incarcerated as such for life, or at least till the advent of our own more enlightened era. Doubtless we have equally honest and truthful, and equally discredited 'visionaries,' labouring, at this moment, to enlighten our own remaining darkness.——The Emperor of all the Russias has just adopted the project of a vast railway, which is to join his three capitals, Moscow, St. Petersburgh, and Warsaw. The terminus is to be the fortress of Warsaw. The precise plan is not yet decided on.

TO CALCULATE THE TAPER OF SPIRES.

Sir,—Will you be so kind as to shew me a simple way to calculate the "taper," per foot, of pinnacles and spires, when the diameter of the base, the height, and the diameter of the top, are given?

I am, Sir, &c., J. H. D.

Say for example, base of spire 24 ft. 6 in. diameter; apex, 10 in.; height, 122 ft. 6 in.

To calculate the taper per foot.—Say, as the whole height is to the whole taper, so is one foot of height to the quantity of taper per foot.

The whole taper is equal to half the difference between the diameters of the base and top of the spire; that is

(24 ft. 6 in.—0 ft. 10 in.) ÷ 2 = 11 ft. 10 in. the whole taper; then it is,—

Whole height .. 122 ft. 6 in. = 1470 in.
Whole taper .. 11 ft. 10 in. = 142 in.
One foot in height..... = 12 in.

Hence we have 1470 : 142 :: 12 : 1·159 inch, the taper for each foot in height.

THE IRON TRADE.

Notwithstanding the assurance of the iron masters, or their authorities of the press, that no alteration of previous prices for the *worse*—as they have it—was sustained at the late quarterly meetings, it now appears that "in consequence of a number of the iron masters of Lanarkshire persisting in their resolution of reducing the wages of their workmen at the rate of 1s. per day, *because of a fall in the price of iron*," the operatives in some of the works have ceased working, and are now being supported from the funds of their association, which, we believe, says a Glasgow paper, is a strong and well-organised union. The men, it is said, are willing to submit to a slight reduction, say 3d. or 4d. a day, but seem resolved not to work on the terms proposed by the masters. The effect is, that furnaces are blown out in many of the mining districts—the men are at present going about idle, and the masters are taking measures for ejecting them out of their houses.——At the Wolverhampton police-office, on one of these late melting days of heat, five puddlers were brought up for absenting themselves from work without permission, whereby a loss to their employer, Mr. Baldwin, of 50*l.* had been incurred. The men pleaded "the excessive heat of the weather, which rendered it quite impossible for them to work." Mr. Barker, the worthy magistrate of police told them they had no right to suspend the work, which they had thus declared it to be impossible to go on with, unless the sanction of their employers had been obtained! Necessity has not seldom been transmuted into a virtue, but Mr. Barker has in this case the merit—not an original one certainly—of converting it into a vice. The five unfortunate puddlers, thus turned out of the frying-pan into the fire, were accordingly found guilty of not doing what it was impossible to do, and they were accordingly committed to hard labour for a month!——The heat seems to have somewhat puddled the brain of another unfortunate puddler at Wednesbury about the

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